REMARKS

Claims 1-30 are pending. By this amendment, claims 1, 10, 21 and 26 have been amended. Applicant acknowledges receipt of the Office Action dated November 20, 2007. Claims 8 and 19 were rejected under 35 U.S.C. §112 second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Claims 1-30 were rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent Publication No. 2004/0044833 to Ryan ("Ryan") in view of U.S. Patent No. 5,502,621 to Schumacher et al. ("Schumacher"). Claims 1-30 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over copending U.S. Patent Application No. 11/417,389 to Janzen ("Janzen") in view of Ryan and Schumacher. Claims 1-20 and 22-30 were further rejected as being obvious over claim 37 of Janzen in view of Ryan and Schumacher.

The embodiments disclosed in the present application will now be discussed in comparison to the cited references. Of course, the discussion of the disclosed embodiments, and the discussion of the differences between the disclosed embodiments and the cited references, does not define the scope or interpretation of any of the claims. Instead, such discussed differences merely help the Examiner appreciate important claim distinctions discussed thereafter.

The present application is directed to solving the problem of skew and cross talk associated with signals that are being transmitted between memory chips and a memory hub. The application is interested in reducing skew and cross talk while at the same time creating smaller and more dense memory modules. In one embodiment, pairs of memory devices are positioned around a memory hub, where the memory devices do not comprise pins or leads that extend beyond the perimeter of the memory devices, thus reducing space on the memory module. In another embodiment, the control-address busses of two memory devices share a common path, where the two memory devices are from different pairs. This prevents cross talk while maintaining control-address busses of roughly the same length to prevent skew.

The Ryan reference discloses pairs of memory devices positioned around a memory hub. Separate busses 230-244 couple each memory device to the memory hub. The Ryan reference teaches using separate busses to provide the shortest possible path between each

memory device and the memory hub. See, paragraph 25. The busses 230-244 may comprise separate command, address and data buses or a signal bus for packets containing command, address and data bits between the memory hub and each corresponding memory device. See, paragraph 24. The Ryan reference does not disclose or fairly suggest that two memory devices share a command-address bus.

The Schumacher reference discloses a surface mount board having two memory controller chips mounted 180 degrees from each other. This orients pins with the same type to be opposite each other. The benefit of doing this is so that it simplifies the pin or lead routing that extend beyond the perimeter of the device. In particular, pins or leads emanating from the device are routed in the same direction and are less likely to have cross over related problems. See, column 4, lines 13-39. The reference fails to disclose or fairly suggest that the pins do not extend beyond the device.

Turning now to the claims, the patentably distinct differences between the cited references and the claim language will be specifically pointed out. Claims 1 and 21 recite, in part, "a plurality of command-address busses, each command-address bus coupled to the memory hub and at least two memory devices, the two memory devices being from a different pair." Neither the Ryan reference nor the Schumacher references in combination or by themselves, discloses or fairly suggests this limitation. As alluded to above, the Ryan reference discloses that each memory device use its own bus system for communicating with the memory hub. In addition, it teaches away from using a common path for two memory devices by stating that the individual busses allow for the shortest path possible between each memory device and the memory hub. See, paragraph 25. The Schumacher reference fails to make up for this limitation. Therefore claims 1 and 21 are allowable over the Ryan and the Schumacher references.

Claim 10 recites, in part, "each memory device having the same physical pin layout without pins or leads extending beyond an outer perimeter of each respective memory device." Neither the Ryan reference nor the Schumacher reference, in combination or by themselves, discloses or fairly suggests the above limitation. As alluded to above, the Schumacher reference discloses memory control chips having the same pin layout, however, the leads extend beyond the outer perimeter of the memory device. In particular, the Schumacher

reference uses this same pin layout for the benefits associated with leads extending beyond the surface of the chips. In particular, the Schumacher reference states that leads emanating from the devices that are routed in the same direction are less likely to have cross over related problems. The Ryan reference fails to make up for what is not disclosed in the Schumacher reference. Therefore, claim 10 is allowable over the Ryan and Schumacher references.

Claim 26 recites, in part, "coupling control-address signals between the memory hub and two memory devices via a common path, the two memory devices being from different pairs." Neither the Ryan reference nor the Schumacher reference, in combination or by themselves, discloses or fairly suggests the above limitation. As stated above, the Ryan reference discloses that the control-address signals coupled between the memory hub and each memory device should have their own path so that the path may be the shortest path possible. See, paragraph 25. The Schumacher reference fails to make up for this limitation. Therefore claim 26 is allowable over the Ryan and the Schumacher references.

Claims depending from claim 1, 10, 21, and 26 are also allowable due to depending from an allowable base claim and further in view of the additional limitations recited in the dependent claims.

All of the claims remaining in the application are clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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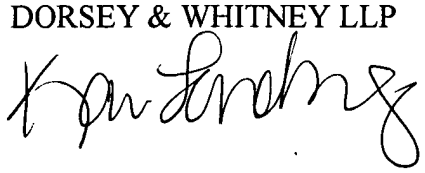

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Enclosures:

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